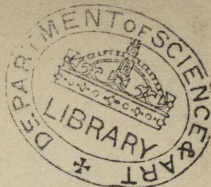


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S. & A. Dept.  
Murchison, Sir R.

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REPORT ON  
THE GEOLOGICAL SURVEY, GEOLOGICAL  
MUSEUM, SCHOOL OF MINES, AND  
MINING RECORD OFFICE.

1862.

Box II

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1. The Geological Survey of the United Kingdom; the collections of the Geological Museum containing Specimens which illustrate the Survey; the School of Mines and scientific Geology; and the Mining Record Office, have been supported by Parliament for many years as objects of National importance, and have been gradually connected together as one institution.

2. Seeing no reason to question the sound policy of continuing to promote these objects by public funds, we have directed our inquiries to the best means of improving their administration and extending their usefulness.

GEOLOGICAL SURVEY.

3. The *Geological Survey* is proceeding satisfactorily. The increasing sales of the maps indicate the public appreciation of it; and the memoirs which Sir Roderick Murchison has caused to be prepared to accompany the maps, add to their interest and usefulness.

4. There are some points in the present administration of the *Geological Museum* which require amendment: some of these are connected with want of space, and some with want of staff. But before entering on these topics, we prefer to notice the *School of Mines*, the efficient administration of which is also dependent on the provision of adequate space in the building.

SCHOOL OF MINES.

5. The *School of Mines* is at present the only large and comprehensive institution of the kind in this country, although attempts have been made to establish somewhat similar institutions in various seats of mining industry.

6. This school was commenced in 1851, and was intended by its originator, Sir H. De la Beche, to afford practical Scientific instruction applicable to mining operations, such instruction being illustrated by the Geological Survey and its collections.



7. Courses of instruction have been laid down as shewn in a printed prospectus which is published. Examinations have been established and Exhibitions founded.

8. At the time of the commencement of this enquiry, those students who entered for *all* the courses of the lectures were termed "*matriculated*," and made one payment of 30*l.* or two annual payments of 20*l.*, whilst those attending some courses only, were termed "*occasional*." The "*matriculated*" students were those who avowedly devoted themselves to the especial object of the Mining School. Some "*occasional*" students, though not attending the whole matriculated course of instruction, may be reckoned as having had mining instruction in view.

9. The annual average of "*matriculated*" students during nine years has been only twelve, that of "*occasional*" fifty-four. The number of "*matriculated*" students must therefore not be viewed as the only test of the School. If they were, its maintenance by public funds could hardly be justified. A large proportion of both classes of the students have found employment in the Government Home and Colonial Surveys, and in various Chemical, Metallurgical, Mining, and other Works in the British Dominions.

10. It has been recommended that the distinctions between "*matriculated*" and "*occasional*" students should be abolished, and that all the examinations, prizes, and exhibitions of the school should be thrown open to all its students.

11. The Professors agree that in view of the practical necessities of the existing class of Mining students the instruction at present embraces too wide a range of study in certain directions, and might with advantage be more closely confined to those Sciences which directly bear upon Mining. But they also observe that the instruction begins at an elementary point because the students do not come sufficiently prepared, and that certain essential branches of a Mining education are not represented in the School. Some of the Professors therefore suggest that it would be desirable to add Mining Surveying, and the construction of Mining and Metallurgical Machines, to the courses of instruction, and to exclude some subjects at present taught from the Mining *curriculum*.

12. The principles which we consider should be adopted in the reorganization of the school are as follows.

13. The aim to be kept always in view should be to make the school as directly useful as possible to the great mining



interest ; to teach the greatest numbers ; and with the view of rendering the school as self-supporting as possible the Professors should derive the principal part of their incomes from fees. From time to time a revision of the Government Subsidies and a re-apportionment of the fees among the Professors should be made, always having due regard to the interests of the existing Professors.

14. All suggested changes in the management should be submitted for the approval of the Lord President.

15. The instruction should have especial reference to Mining, and should be of a technical character such as is not obtainable elsewhere, embracing those branches only of general Science which are applicable to Mining, and touching on Chemistry, general Mechanics, Physics, and Natural History, only as far as is required for Mining purposes. Though it may not be possible at once to cease giving instruction of an elementary character, this should be considered an arrangement of a temporary nature, to be modified annually as the standard can be raised.

16. For the present, general instruction in Mechanics, Physics, and Natural History may be given (by lectures) in the evening classes. In order to mark emphatically the primary work of the school, all instruction *special* to Mining should be given in the daytime.

17. *Admission of Students.* If the matriculation fee be abolished, perhaps the separate fees for each subject might be slightly increased. A limited number of persons possessing elementary knowledge in certain Sciences bearing on Mining (say for the present one for every 20*l.* paid by the State to the Professor), should be admitted without payment of the *fees*. A test of the possession of the requisite knowledge by candidates seeking for free admission might be afforded by the prizes and certificates given in the local examinations of the Science and Art Department, King's College, University College, and other public Schools, and the Society of Arts. When such applications exceeded the number of Free Studentships, then preference should be given by a special competition. Other persons might be admitted without examination by payment of fees as at present.

18. As a commencement eight Exhibitions of the value of 50*l.* a year each should be established, to be given, after a competition open to the whole country, to qualified students, and to be held for three years.



19. The present Exhibitions are, H.R.H. the Duke of Cornwall's two Exhibitions of 30*l.* each, which are held for two years, and the Government Exhibitions, two of 15*l.* each and one of 25*l.*, held for one year. They should hereafter be called "Scholarships," and be increased in number. They should be given by competition to students who have attended at least one year, so that they may be held with the Exhibitions already spoken of.

20. It is to be hoped that the leading Mining Proprietors and others interested in the subject, will establish endowments in connection with this scheme.

21. *Examinations.* All the students should be examined once in the year as a condition of their continuing to belong to the School, and prizes and certificates of competency in the various subjects should be given. No special fee should be charged for this examination.

22. It has been suggested that the name should be changed to the Royal School of Mines, and we think this desirable.

23. The measures recommended above would bring the School into direct relations with, and would stimulate, in various ways, the scientific instruction carried on in all parts of the country.

24. Sir R. Murchison should be requested to prepare, in concert with the Professors, a prospectus of the Courses of Instruction of a School based upon these principles for the consideration of the Committee of Council on Education, in order that the new system may come into operation in the Autumn.

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25. We now turn to *General Scientific Instruction* as distinguished from the special object of the proposed School of Mines. It may be considered under two heads, 1st the preliminary elementary instruction (in those Sciences which bear on Mining) which is rendered necessary by the students not being sufficiently prepared on entering; 2nd, general instruction in Science such as is afforded in the evening lectures to working men and evening lectures to teachers.

To the 1st head the remarks in §§ 15 and 16 apply, viz., that this elementary instruction must be considered an arrangement of a temporary nature to cease as soon as the standard of attainment on entrance can be raised sufficiently high, and that it should, with the exception of Chemistry, be given as far as possible in the evening.



With respect to the 2nd head ; this general instruction should be regarded as incidental, and due to the fact that the Mining School exists. If there were no Mining School it is doubtful if general instruction in Science should be undertaken by the Government. The Science examinations of the Committee of Council already prove that the public, with a slight stimulus, will provide it for themselves. Nor is it justifiable that the State should be at the cost of providing Scientific Lectures to the working men only in a particular district of the Metropolis, whilst a similar advantage is not afforded to other places. But as a staff of Professors has been formed for other purposes, there can be no objection to their giving these lectures which are popular, which cost the State nothing, and may be viewed not as an official duty but an act of good will on the part of the Professors. When the Mining School becomes much larger, it may be a question if these lectures ought not to be given up.

### GEOLOGICAL MUSEUM.

28. The building in Jermyn-street is sufficient for the display of the British Geological and Mineral specimens, but it does not provide sufficient accommodation for Foreign specimens or the models of Mining Machinery. The rooms for the Curators, and Professors are inconveniently small and ill-lighted. The ventilation throughout is defective, and in some places the lighting and usefulness of rooms have been sacrificed to architectural effect. Sir R. Murchison pointed out that houses adjoining the Museum might be obtained, one in Piccadilly and one in Jermyn-street, to remedy the want of space, but we cannot recommend this proposal. A temporary remedy may be found by using the Curator's house, whereby not only the Professors would acquire sufficient accommodation but the large and lofty room used for the working out of fossils would be reannexed to the Museum.

29. There have never been any accurate registers made of all the property of the Institution, and there is no system of recording mechanically what enters the Museum, which there ought to be quite independently of the detailed scientific cataloguing. This duty should be assigned to the Registrar, who should be considered the Curator of the whole property. A Stores Register should be established to record everything that enters or leaves the Museum, and when objects have been entered in this register they should be passed on to the respective Professors to prepare the scientific labels, and the Registrar should be held responsible for reporting to the Director that this



work is performed and not allowed to fall into arrear. The monthly report of the work done in this respect should be sent to the Committee of Council on Education. An additional clerk would be required to assist in this work, which is quite indispensable.

30. The numbers attending the Museum have been nearly stationary at about 25,000 for the last four years. The Committee of Council have already recommended that the Museum should be lighted and opened some evenings, and we recommend that the lighting, not of the whole, but of certain portions of the Museum be proceeded with forthwith, not merely to give greater facilities of visiting to the general public, but to increase the use of the Museum to students who attend the evening courses.

31. We consider that the enumeration of visitors and some other arrangements connected with catalogues and administration might be established here, so as to increase the usefulness and popularity of the Museum.

#### MINING RECORD OFFICE.

32. The Mining Records refer chiefly to the Metalliferous Mines in Cornwall and Devon. Plans of nearly all the workings of the mines in these Counties have been completed. The "Mineral statistics" in the memoirs of the Geological Survey, which are published annually, are highly valued both in England and abroad.

33. The Records of the Coal Mines are comparatively few. They cannot be obtained without paying the coal viewers for them. It has been suggested that it ought to be compulsory to lodge plans in this office, when Colliery workings are abandoned. We agree in this suggestion, and consider it should be brought before the Secretary of State for the Home Department.

34. The administration of this office should be made more official and precise.

35. Except to persons who have furnished plans or rendered service, a moderate fee for consulting and searching plans should be charged, and a register should be kept of all applications, shewing name, address, and business of the applicant and the object of the search. The fees should be paid into the Exchequer.

36. The Catalogue of the plans in the office should be published systematically every year, advertised in proper channels, and sold. A copy of each edition might be usefully sent



to every person who had been a donor to the office, and to the local Mining Schools and Classes.

### NATIONAL EXAMINATIONS.

37. *Degrees, etc.* It has been suggested that a further encouragement to the acquirement of Mining Science might be given by Diplomas conferring some title.

38. It is probable that besides the "Schools of Mines" of Cornwall, Glasgow, Bristol, and Wigan, already existing, Mining Schools will be gradually established in other parts of the Kingdom, and that Mining Science will also be acquired by other means. It is highly desirable to give the whole a culminating point.

39. But it is obvious that an universal Diploma could not be granted by any one School in London, however eminent. Any Diploma must be granted by an independent and impartial agency.

40. The University of London seemed to fulfil all the necessary conditions, having already by Charter the requisite powers. But it has been found that no arrangements can be made with the University of London as classical knowledge is considered indispensable in the matriculation examination.

41. We do not consider it expedient at present to recommend that a new body should be incorporated by Charter for the special purpose of conferring degrees in Mining Science.

42. Under these circumstances we are of opinion that a General Examining Board should be established, to grant Certificates of Competency and of Merit of three grades in Mining Science.

43. The Examiners should be appointed annually by the Committee of Council on Education.

44. It would be of great advantage if the possession of the proposed Certificates were made a condition to the appointment of a Mining or Colliery Inspector and other Government appointments.

(Signed) GRANVILLE,  
C. E. TREVELYAN,  
ROBERT LOWE.

HENRY COLE, Secretary.

19th June 1862.



## APPENDIX.

28 Jermyn Street, S.W.,

12 July, 1861.

Sir,

In reference to the conversation you held yesterday with the Council of Professors in this establishment, I have first to report, for the information of the Lords of the Committee of Privy Council on Education, that my colleagues and self are of opinion, that the Degree which has been suggested for acquirements in the Sciences relating to Mining might with very great advantage be granted by the University of London.

As to the branches of Science in which the Examinations of the University should take place with a view to the granting of such Mining Degree, we think, that the subjects for final examination which should be required of Candidates, are the following:—

Mineralogy.

Mining.

Mining Mechanics.

Mining Surveying.

Mechanical Drawing.

Practical Geology, with Palæontology, and

Metallurgy.

It is obvious, however, that no Candidate could be in a condition to pass such *final* Examination unless he possessed a competent knowledge of Mathematics, Physics, Chemistry, and Natural History.

I remain, Sir,

Your obedient Servant,

RODERICK I. MURCHISON.

Henry Cole, Esq., C.B.

H.C.

27.8.96

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